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ALGEBRA 1 COMPUTER WORKSHEET NON-LINEAR GRAPHS

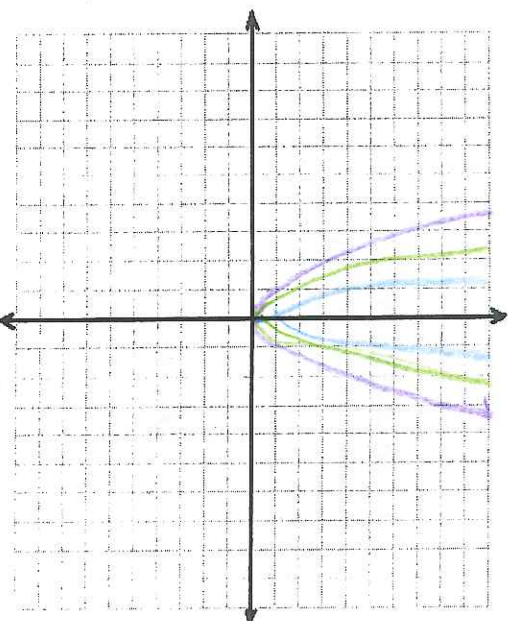
SLOPE

1. Sketch all 3 graphs on the same axes
(color coding with key!)

$$Y = x^2$$

$$Y = 2x^2$$

$$Y = 8x^2$$



Generalize: When the x^2 is multiplied by a coefficient, then the graph will
become more narrow.

2. How do you think you might get the graph to be flatter?

Experiment with several options. When you discover the answer, give 3 equations that are flatter and make a generalization.

$$Y = .1x^2$$

$$Y = .05x^2$$

$$Y = .01x^2$$

coefficient less than 1
greater than zero

Generalize: When the x^2 is multiplied by a coefficient less than one, then the graph will
become more wide or flatter.

3. How do you think you might get the graph to be upside down?

You use negative number.

Generalize: When the x^2 is multiplied by a negative, then the graph will be upside down.

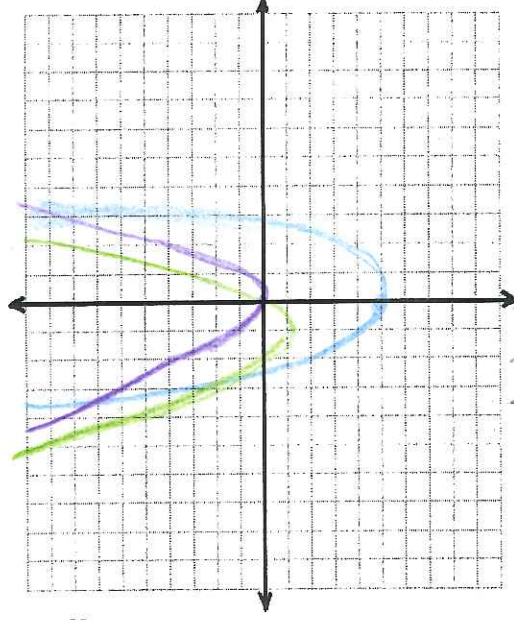
TRANSLATION

4. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = x^2 + 2$$

$$y = x^2 - 5$$



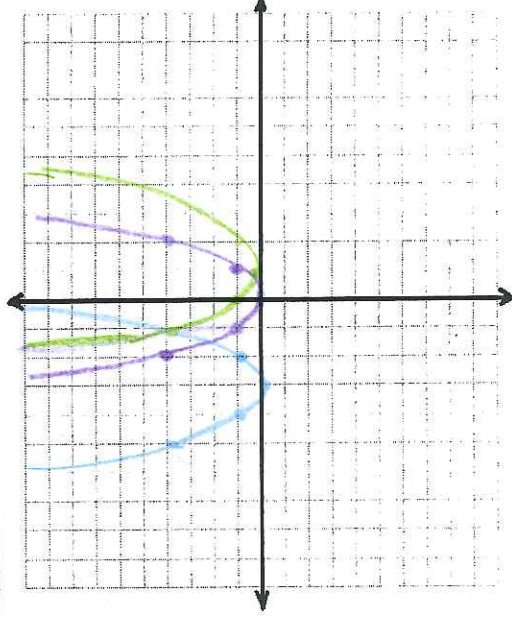
Generalize: When you add to x^2 , the graph will ~~move~~ translate up on the y-axis.
When you subtract from x^2 , the graph will move down on y-axis.

5. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = (x + 3)^2$$

$$y = (x - 1)^2$$



Generalize: When you add to x in the parenthesis, the graph will

translate to the left

When you subtract from x in the parenthesis, the graph will

translate to the right

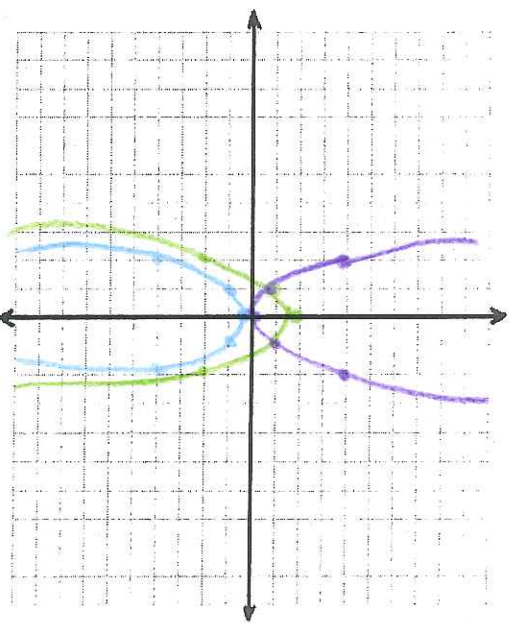
REFLECTIONS

6. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = -x^2$$

$$y = -x^2 + 2$$



Generalize: When a is positive, the graph will be a min.
When a is negative the graph will be a max.

Using all the generalizations that you made above, can you:

1. Write a quadratic equation for a graph that has a minimum at the point of $(0, -2)$ and is flatter than $y = x^2$?

$$y = \frac{1}{4}x^2 - 2$$

2. Write a quadratic equation for a graph that has a maximum at the point of $(0, 5)$ and is thinner than $y = x^2$?

$$y = 4x^2 + 5$$

3. Write a quadratic equation for a graph that has any vertex at the point of $(4, -2)$?

$$y = (x + 4)^2 + 2$$

4. Write a quadratic equation for a graph that has a maximum at $(-2, 0)$? $y = x^2 + 2$

